

Application No. 10/700,329
Amendment dated February 14, 2008
Reply to Office Action of December 21, 2007

REMARKS/ARGUMENTS

Applicant has carefully reviewed and considered the Office Action mailed on December 21, 2007, and the references cited therewith.

Claims 1 and 16 are amended, no claims are canceled, and no claims are added. Claims 25-63 were withdrawn pursuant to a restriction requirement. As a result, claims 1-13 and 16-24 are now pending in this application.

Information Disclosure Statement

Applicant respectfully requests that a copy of the 1449 Form, listing all references that were submitted with the Information Disclosure Statement filed on October 10, 2005, marked as being considered and initialled by the Examiner, be returned with the next official communication.

Claim Objections

Claims 1 and 16 were objected to because of informalities. Applicant has amended claims 1 and 16 to correct the typographical errors with respect to complementary beam-forming, commensurate with the specification.

§103 Rejection of the Claims

Claims 1-13 and 16-24 were rejected under 35 USC § 103(a) as being unpatentable over Periyalwar (U.S. Patent No. 6,611,695) in view of Adachi et al. (US Publication No. US 2003/0064752 A1). Applicant respectfully traverses the rejection as follows.

Applicant does not admit that the Adachi application is prior art and reserves the right to swear behind the same at a later date. Nonetheless, in the interest of advancing the prosecution of the present application, Applicant respectfully submits that the elements and limitations of the claims of the present application can be distinguished from the teachings of the Periyalwar and Adachi references for at least the following reasons.

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Applicant's independent claim 1 presently recites:

a multi-beam directed signal system configured for 802.11 specification data packet wireless computing communication with a 802.11 client computing device; and

an antenna assembly configured to receive and emanate wireless communication within a directed beam with the computing device,

wherein the multi-beam directed signal system is configured to determine and adjust, by complementary beam-forming to increase side lobe levels, a transmission peak for a particular directed beam in a non-omni-directional manner based on operational information associated with signal routing, and further configured to direct a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction.

Applicant's independent claim 16 presently recites:

generating from a Wi-Fi switch a directed wireless communication for 802.11 specification data packet communication with a 802.11 client computing device;

receiving the directed wireless communication at an antenna assembly;

emanating a directed communication beam associated with a transmission peak, which is adjusted relative to other beams of a multi-beam directed signal system by complementary beam-forming to increase side lobe levels, in a non-omni-directional manner for the data communication with the computing device; and

directing a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction.

With respect to independent claims 1 and 16, Applicant respectfully submits that the Periyalwar reference, in view of the Adachi application, does not describe, teach or suggest each and every element of claims 1 and 16. In particular, neither the Periyalwar reference, nor the Adachi application, appear to describe, teach or suggest complementary beam-forming.

Page 3 of the Office Action mailed December 21, 2007 acknowledges that the Periyalwar reference does not disclose, "a multi-beam directed signal system configured for 802.11 specification data packet wireless computing communication

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with a 802.11 client computing device; and wherein the multi-beam directed signal system is configured to determine and adjust, by complementary beam-forming, a transmission peak for a particular directed beam in a non-omni-directional manner based on operational information associated with signal routing, and further configured to direct a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction”.

The Office action suggests that the Adachi application discloses these missing limitations (citing Figs. 12 and 15, and paragraphs 148, 151, 162, 164, 167 and 171-174). In particular, the Office Action states “the beam is adjusted to the direction of a device it is communicating to and narrows the beam on the device to reduce the null effect and maintaining power consumption for longer distance devices”.

Applicant respectfully submits that assertion in connection with the Adachi application does not describe, teach, or suggest, and is not equivalent to, complementary beam forming. That is, adjusting and narrowing does not equate to complementary beam forming as defined by the present disclosure, which entails more than mere directed wireless communications.

Paragraphs [0114] – [0117] of the present application describe complementary beam forming as “a technique to reduce the effect of communication beam nulls and increase side lobe levels without a severe power penalty to the main beam.” Complementary beam-forming, as described in the present application, is utilized as a technique to ensure a minimum transmit power in all directions, by reducing the “hidden beam” effect of nulls in certain directions that may accompany a directional communication beam, such as in Adachi. That is, forming directional transmit communication beams, as in Adachi, has the side effect of hiding the transmitted energy from some client devices, negatively impacting their carrier sense mechanisms in a network.

A client device can measure the energy transmitted from access points and from other client devices. If a client device cannot detect the presence of other

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transmissions, due to use of directional communication beams, it may interpret the medium as being idle and attempt to access the medium, when, in fact, the medium is busy. These competing access attempts have a burdening effect on the performance of the network.

Complementary beam-forming, as claimed and defined by the present application, ensures that multiple transmit beams in arbitrary directions are complemented by another beam in all other directions. The complimentary beam does not interfere with the intended beams and increases the probability that other users in the network can detect whether the medium is idle or available for their use, thus contributing to the efficient usage of the network.

From Applicant's review, the cited portions of the Adachi application (Figs. 12 and 15, and paragraphs 148, 151, 162, 164, 167 and 171-174) appear to describe directing a communication beam, for example, by using weighting factors associated with a directional antenna, to reduce the influences of interference on an unintended base station or terminal using an identical channel. The reference, however, does not teach complementary beam forming as described above. The Periyalwar reference does not appear to cure the stated deficiencies in the Adachi application, as acknowledged by the Office Action.

Accordingly, Applicant respectfully submits that the claimed invention is neither taught by, nor made obvious in view of, the combination of the Periyalwar and Adachi references. As such, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of independent claims 1 and 16, as currently amended, as well as those claims that depend therefrom.

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CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Edward J. Brooks III at (612) 236-0120 to facilitate prosecution of this matter.

CERTIFICATE UNDER 37 CFR 81.8: The undersigned hereby certifies that this correspondence is being transmitted to the United States Patent and Trademark Office facsimile number (571) 273-8300 on this 14 day of February, 2008.

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